



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,004	07/10/2001	Yukihiro Yoshimine	P107336-00025	7630

7590

12/11/2002

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
1050 Connecticut Avenue, N.W., Suite 600
Washington, DC 20036-5339

EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
----------	--------------

1753

7

DATE MAILED: 12/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No. 09/901,004	Applicant(s) YOSHIMINE ET AL.	
	Examiner Brian L. Mutschler	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Comments

1. The objection to the specification has been overcome by Applicant's amendment.
2. The objection to the drawings has not been overcome. As disclosed in the brief description of the drawings, the solar cell modules represented by the figures are "conventional solar cell modules," which should therefore be labeled "Prior Art." Furthermore, Applicant's response has not amended the drawings in any way.
3. The rejection of claims 3, 4 and 6-9 under 35 U.S.C. 112, second paragraph, has been overcome by Applicant's amendment.
4. The rejection of claims 1, 3, 5 and 6 under 35 U.S.C. 102(b) over Komori et al. (EP 0 829 909 A2) has been overcome by Applicant's amendment. As indicated in the prior Office action and in Applicant's response, Komori et al. does not disclose the use of a resin film located between the front protective surface and the solar cell.

Drawings

5. Figures 10, 11, 12 and 13 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kataoka et al. (U.S. Pat. No. 6,307,145).

Kataoka et al. disclose a solar cell having a front surface protective layer **103**, a rear surface film **105**, and a solar cell **101** and resin film **108** sealed by sealing resin **102** and **104** (fig. 1A). The resin film **108** is smaller than the front and rear surface protective layers **103** and **105** (fig. 1A).

Regarding claim 3, the resin films **105** and **108** are resistant to thermal expansion and thermal contraction and can be cross-linked to enhance heat resistance (col. 8, lines 36-39; col. 11, lines 1-4). Resin film **105** can be made using polyethylene terephthalate, which has a heat shrinkage rate of 0.6-0.7% (col. 8, line 40-42). Resin film **108** is made of materials including acrylic resins, which have heat shrinkage rates of 0.2-1.0% (col. 10, lines 61-65). (The heat shrinkage rate is an inherent property of materials.)

Regarding claim 5, the resin film **108** is smaller than the overlaying area of the front and back surface protective layers **103** and **105** (fig. 1A).

Since Kataoka et al. teach the limitations recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori et al. (EP 0 829 909 A2) in view Yamada et al. (EP 0 860 886 A2) and in view of admissions made in the disclosure of the instant application.

Komori et al. disclose a solar cell module having a front surface protecting layer **104** and a rear surface protecting layer **107**, and an insulating resin film **106** and a solar cell **101** sealed by a sealing resin **103** (fig. 1B). The resin film **106** is smaller in size than the front and rear surface protecting layers **104** and **107** (p. 6, lines 45-55). The resin film **106** has "long-term durability...against thermal expansion and thermal shrinkage" (p. 6, line 50). Komori et al. disclose a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the insulating resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block by 80 mm on each side (p. 10, lines 2-13). Therefore, the insulating resin film **407** was about 65 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block.

Regarding claim 2, Komori et al. further disclose the use of a glass front surface protective layer **104** and a resin film rear surface protective layer **107** (p. 5, line 58; p. 7, line 16).

Regarding claim 5, the insulating resin film **106** is “disposed so as not to be present at the bending portion of the substrate” and is smaller in size than the protective layers **104** and **107** (p. 6, lines 46-47; fig. 1B).

Regarding claim 7, Komori et al. disclose a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the insulating resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block by 80 mm on each side (p. 10, lines 2-13).

Regarding claims 8 and 9, Komori et al. further disclose the use of a glass front surface protective layer **104** and a steel sheet rear surface protective layer **107** (p. 5, line 58; p. 7, line 5). The resin film **106** extends beyond the edges of the solar cell block **101** but does not reach the edges of the surface protective layers **104** and **107** (fig. 1B). The insulating resin film **106** “ensures a sufficient electrical insulation of the electroconductive substrate” (p. 6, lines 49-50). Furthermore, Komori et al. show the use of connectors **306** connecting adjacent solar cells **301**, all encapsulated within a sealing resin **302** (fig. 3).

The solar cell module of Komori et al. differs from the instant invention because Komori et al. do not disclose the formation of the resin film between the front surface protective layer and the solar cells within the sealing resin, as recited in claim 1, the use

of a *transparent* resin film as the rear surface protective layer, as recited in claim 2, the use of wiring, as recited in claim 8, and the use of insulating tape covering the wiring, as recited in claim 9.

Regarding claim 1, Yamada et al. disclose the formation of a solar cell module comprising a front protective member **104**, a rear protective member **101**, a solar cell **102** and a resin insulating film **105**, wherein the solar cell **102** and resin insulating member **105** are contained within a sealing resin **103** (fig. 1). The sealing material **103** completely contains the solar cell **102** and the resin film **105** to "protect the solar cell device from stress or the like from the outside" (p. 3, lines 45-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the sealing resin of Komori et al. to completely contain the solar cell and resin film as taught by Yamada et al. because completely enclosing the solar cell device within the sealing resin would "protect the solar cell device from stress or the like from the outside" (p. 3, lines 45-46).

Regarding claim 1, the instant application identifies the use of resin films between the front surface and the solar cell as prior art (p. 2, lines 10-19; fig. 12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Komori et al. to use a resin film between the front surface protective layer and the solar cell, as identified by the instant application as prior art, because using a resin film between the front surface

Art Unit: 1753

protective layer and the solar cell helps "prevent elution and diffusion of alkaline component from the glass plate" (p. 2, lines 18-19).

In the disclosure of the instant application, it was disclosed that it is known in the art to use a solar cell module capable of receiving light from both the front and the back surfaces of the module by using a glass front surface protective layer **100** and a rear surface protective member comprising a transparent resin film **110** (p. 1, line 17 to p. 2, line 8).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Komori et al. to use a transparent rear surface protective layer as disclosed in the instant application as prior art because using a transparent rear surface protective layer would allow the solar cell to absorb light through both the front and rear surfaces of the solar cell module.

Regarding claims 8 and 9, wires and connectors, such as those disclosed by Komori et al. are equivalent because they perform in exactly the same manner, i.e. conducting electricity from one device to another through the use of a thin electrically-conductive material. It is also well known to use insulating tape to cover exposed wiring in electrical applications to prevent short-circuiting and also to protect against electrical shock. For example, electrical tape is extensively used by electricians and others making electrical connections because it offers a simple and efficient means of insulating exposed conductors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Komori et al. to use wiring and to cover the wiring with insulating tape because it is well known in the art of solar cells and the field of electrical devices to use wiring and insulating tape in electrical connections because it provides simple and efficient means for connecting electrical devices.

10. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (U.S. Pat. No. 6,307,145).

Kataoka et al. disclose a solar cell module having the limitations recited in claims 1, 3 and 5 of the instant application, as explained above in section 7. The solar cell module has a front surface protective layer **103**, a rear surface film **105**, and a solar cell **101** and resin film **108** sealed by sealing resin **102** and **104** (fig. 1A). The resin films **105** and **108** are resistant to thermal expansion and thermal contraction and can be cross-linked to enhance heat resistance (col. 8, lines 36-39; col. 11, lines 1-4).

Regarding claims 2 and 4, resin film **105** can be made using polyethylene terephthalate, a transparent resin that has a heat shrinkage rate of 0.6-0.7% (col. 8, line 40-42). (The heat shrinkage rate polyethylene is an inherent property of the material.)

Kataoka et al. further disclose a comparative example, wherein the front surface protective layer **103** is made of glass, which has "the oxygen permeability and the water vapor permeability of zero" (col. 14, lines 20-37).

The solar cell module disclosed by Kataoka et al., as depicted in Figure 1A, differs from the instant invention because Kataoka et al. do not disclose an example of a solar cell module comprising both a front glass protective layer and a transparent resin film as the rear surface protecting layer, as recited in claim 2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module disclosed in the first solar cell module disclosed by Kataoka et al. to use a glass front protective member as taught in a second example of Kataoka et al. because glass has a water vapor permeability of zero, which would protect the solar cell from moisture.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (U.S. Pat. No. 6,307,145) in view of Komori et al. (EP 0 829 909 A2).

Kataoka et al. disclose a solar cell module having the limitations recited in claims 1, 3 and 5 of the instant application, as explained above in section 7. Kataoka et al. further show that the resin layer **108** is the same size as the solar cell **101** so that both are completely surrounded by the sealing resin **102**, **104** when fabricated (fig. 1A). This allows the sealant to completely seal the solar cell **101** from the outside.

The solar cell module of Kataoka et al. differs from the instant invention because Kataoka et al. do not clearly disclose how far the resin film is from the edge of the front and rear protective members.

Komori et al. disclose a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the insulating

resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block by 80 mm on each side (p. 10, lines 2-13). This means the resin film **407** is 65 mm from the closest edge.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the resin film of Kataoka et al. to fabricate the module such that the resin film is set at a distance from the edge of the protective layers as taught by Komori et al. because this allows the solar cell module to be sealed completely by the resin sealant, which would provide protection for the solar cell.

Response to Arguments

12. Regarding the rejection of claims 1, 3, 5 and 6 under 35 U.S.C. 102, Applicant's arguments are moot due to the new grounds of rejection.

13. Applicant's arguments filed November 5, 2002 have been fully considered but they are not persuasive.

14. Regarding the rejection of claims 1, 3 and 5 under 35 U.S.C. 102 over Kataoka et al., Applicant has argued that Kataoka et al. does not disclose a resin film between the solar cell and the front surface protective layer (see page 11 of Applicant's response).

15. In agreement with the Examiner's original position, Applicant has noted that "Kataoka et al. discloses a transparent, rigid, organic resin thin film layer 108 provided on the light incidence side of the photovoltaic element 101" (see page 11 of Applicant's response). As can clearly be seen in figures 1A and 1B of Kataoka et al., the resin thin film layer **108** is clearly between the front surface protective layer **103** and the solar cell

101. As such, the solar cell module of Kataoka et al. clearly anticipates the claims of the instant application.

16. Although Applicant does not make any arguments regarding the use of the disclosure of prior art in the instant application, it is noted that the structure of the solar cells used in the rejections is based on Applicant's disclosure regarding figures 10, 11, 12 and 13, which Applicant has termed "conventional solar cell module[s]" (see description of the figures on pages 1-3 and 7 of the instant specification).

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1753

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

blm
December 5, 2002